Claims

1. A sensor comprising

a cantilever (3), wherein a position of the cantilever (3) depends on a parameter to be measured,

an optical resonator (15) formed between two reflecting mirrors, wherein a first mirror is arranged on said cantilever (3) and wherein a length of said resonator (15) depends on the position of the cantilever (3),

characterized by a lens assembly (10) for focussing light onto the cantilever (3), said lens assembly (10) having an output surface (12b) facing the cantilever (3), wherein said output surface (12b) is concave and forms a second mirror of said resonator (15).

2. The sensor of claim 1 wherein said output surface (12b) is substantially parallel to impinging wavefronts of a standing optical wave within said resonator (15).

3. The sensor of any of the preceding claims wherein said lens assembly (10) comprises an output lens having a convex first face (12a) and a concave second face (12b), wherein said second face (12b) forms said exit surface.

4. The sensor of claim 3 wherein said lens assembly (10) comprises an input lens (11) for projecting a divergent incoming light field (9) onto said output lens.

5. The sensor any of the preceding claims further comprising an optical fiber (8) wherein said lens assembly (10) projects an end (8b) of said optical fiber (8) onto said cantilever (3).

6. The sensor of any of the preceding claims wherein said output surface (12b) is coated with a reflective coating.

7. The sensor of any of the preceding claims wherein said cantilever (3) is coated with a reflective coating.

8. The sensor of any of the preceding claims wherein said light is not broken at the output surface (12b).

9. The sensor of any of the preceding claims wherein said cantilever (3) is a lever being fixed at a first end and deviatable at a second end.

10. The sensor of any of the preceding claims wherein said resonator has a loss of less than 20% per round trip.

11. The lens assembly of any of the preceding claims wherein said lens assembly is mounted to a positioning device for positioning a light spot on different parts of the cantilever

12. A scanning force microscope with the sensor of any of the preceding claims.